HP Designjet L25500 series

Add New Substrate

and

Image Quality Troubleshooting procedures

Version 1.0

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TABLE OF CONTENTS

1. Summary 3

2. Color calibration of a printer and color profiling of a substrate 5

3. Media Loading and RIP media profile 6

Recommended Print Modes 8

Print mode parameters 9

4. Optimize media settings 10

Recommended default substrate settings 10

Main printer settings 10

Advanced printer settings 12

5. Image Quality Troubleshooting 14

Substrate Jams or Ink Smears 14

Checking the ink quantity on the substrate 16

Ink smudge issues 17

Graininess or coalescence on dark or saturated colors 18

Vertical Bands 19

Horizontal bands 20

Color Registration 21

Sharpness 21

Black areas look hazy or image gloss is not completely uniform 22

Stains or uneven finishing of image 22

6. How to print at faster speeds 23

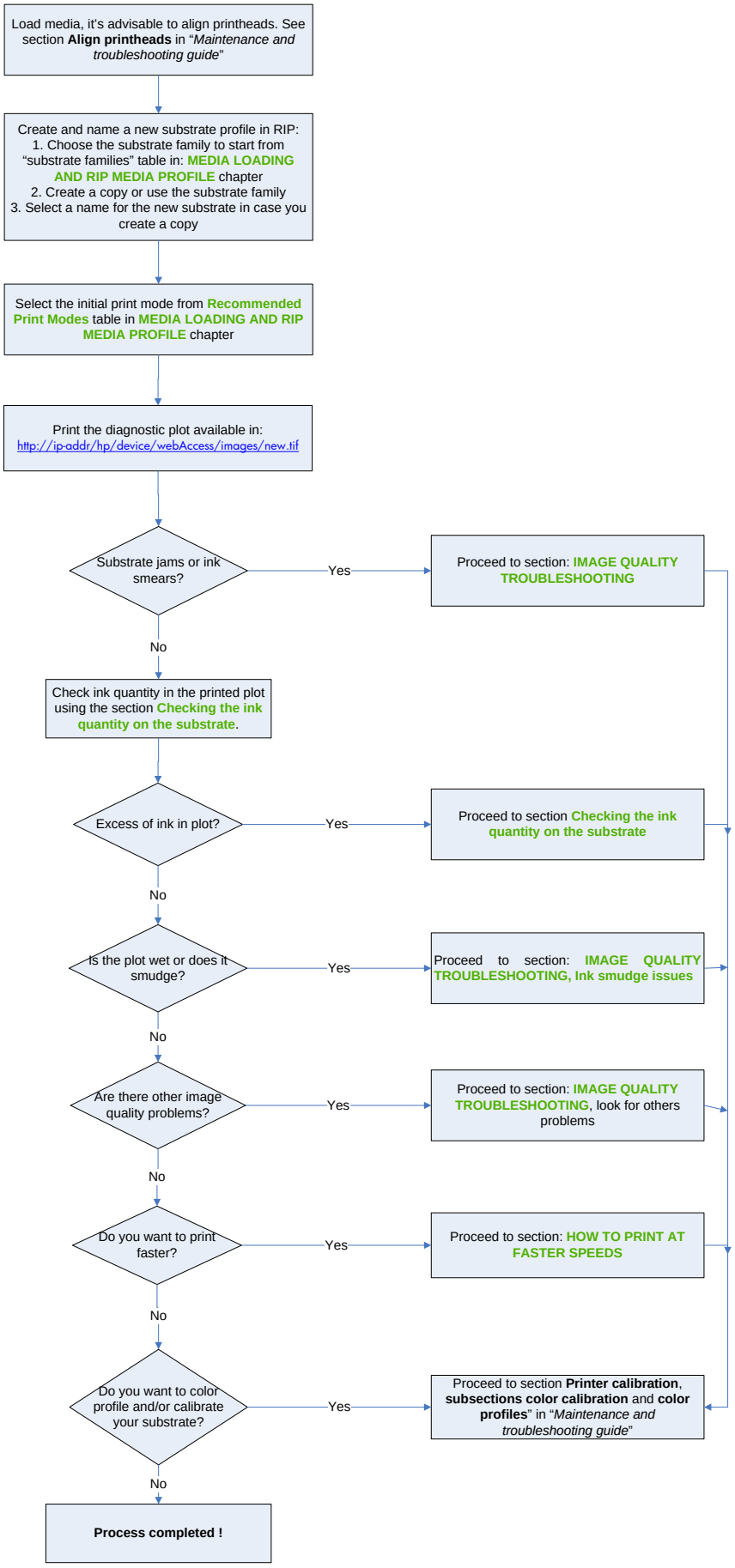
7. Summary for most common substrate problems 24

1. SUMMARY

This section describes the procedure to bring a new Substrate into operation with the printer. Obviously if the RIP media profile for the substrate is already available (see the RIP and the substrate manufacturer web pages) then the procedure can be skipped.

Once the Add New Substrate procedure is completed the number of passes of the printmode can usually be changed without need for any extra action. See "HOW TO PRINT AT FASTER SPEEDS" section.

The **Add New Substrate** procedure consists on the following steps:


Load media, it's advisable to align printheads. See section **Align printheads** in "*Maintenance and troubleshooting guide*"
Create and name a new substrate profile in RIP:
1. Choose the substrate family to start from "substrate families" table in: **MEDIA LOADING AND RIP MEDIA PROFILE** chapter
2. Create a copy or use the substrate family
3. Select a name for the new substrate in case you create a copy
Select the initial print mode from **Recommended Print Modes** table in **MEDIA LOADING AND RIP MEDIA PROFILE** chapter
Print the diagnostic plot available in:
http://ip-addr/hp/device/webAccess/images/new.tif
Substrate jams or ink smears?
Yes
Proceed to section: **IMAGE QUALITY TROUBLESHOOTING**
No
Check ink quantity in the printed plot using the section **Checking the ink quantity on the substrate**.
Excess of ink in plot?
Yes
Proceed to section **Checking the ink quantity on the substrate**
No
Is the plot wet or does it smudge?
Yes
Proceed to section: **IMAGE QUALITY TROUBLESHOOTING, Ink smudge issues**
No
Are there other image quality problems?
Yes
Proceed to section: **IMAGE QUALITY TROUBLESHOOTING**, look for others problems
No
Do you want to print faster?
Yes
Proceed to section: **HOW TO PRINT AT FASTER SPEEDS**
No
Do you want to color profile and/or calibrate your substrate?
Yes
Proceed to section **Printer calibration**, **subsections color calibration** and **color profiles**" in "*Maintenance and troubleshooting guide*"
No
Process completed !

2. COLOR CALIBRATION OF A PRINTER AND COLOR PROFILING OF A SUBSTRATE

Printer can be already used with the color profile you have used to follow the "**Add New Substrate**" procedure. However, depending on your requirements on color accuracy you may want to do the following operations:

- **Color-calibrate printer**
  This operation measures the current color performance of your printer and brings it to "known", stable point. This is useful if you need color consistency along the time—even if you change ink cartridges or printheads. The procedure is to be repeated whenever the ambient conditions change significantly or when changing any printhead. See your RIP manual for details on how to launch the calibration.

- **Color-profile your substrate**
  If the color profile you are using corresponds to a substrate different than the one in your printer, then the colors may not be completely accurate. If this is a problem you can proceed to color profile your substrate using the RIP regular process. Consult your RIP documentation for more details.

3. MEDIA LOADING AND RIP MEDIA PROFILE

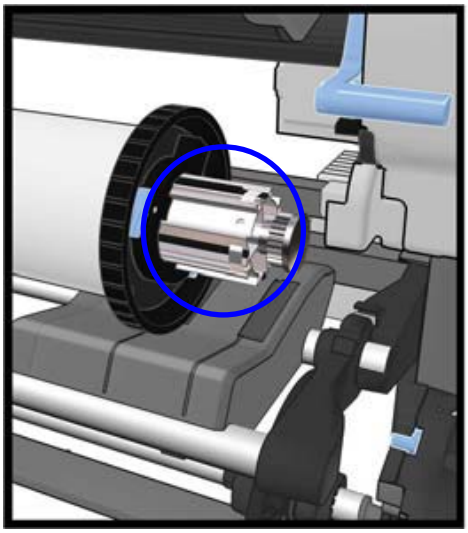
1. Check if your substrate is available from your RIP web site or from your substrate vendor. If not available, you have three options:
   a. Check your substrate profile availability in: http://www.hp.com/go/L25500/solutions
   b. Create a RIP media profile departing from a "parent" RIP media profile, whose family (or printer media profile) is the same or close to that of your substrate. E.g. if you want to use a vinyl from a vendor A you could start from a "generic vinyl" RIP media profile.
   c. Reuse any other RIP media profile from a substrate whose family (or printer media profile) is the same or close to the family of yours. E.g. if you want to use a vinyl from a vendor A you could start from a "vinyl from vendor B" RIP media profile.

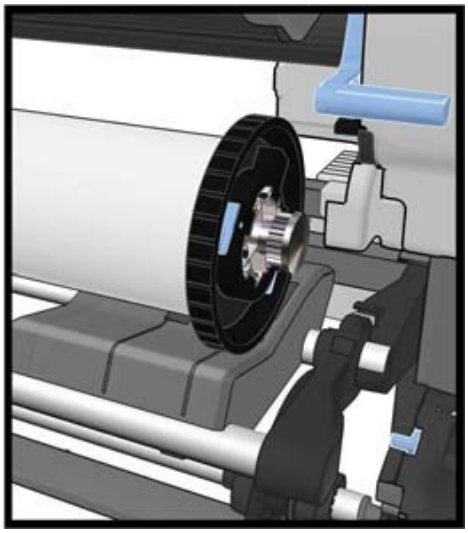
   The following table may help when selecting the right family or printer media profile:

Substrate Family (or Printer Media Profile)	Description
Self Adhesive Vinyl	PVC films with adhesive on one side. There can be white finished or transparent. The liner can be paper or plastic based. There are 2 main manufacturing processes: calendering and casting. Also, there are varieties such as perforated vinyl to be placed on windows. For those substrates Manual Printheads Alignment may need to be used instead of the Automatic one. **Example: HP Air Release Adhesive Gloss Cast Vinyl,** Avery MPI3000 (calendered), Avery MPI1005 (cast), 3M IJ-380 (cast)…
Banner	Usually a polyester mesh (or fabric) covered with PVC coating. There are also recyclable types to cover the same applications (green banners). Banners can be frontlit or backlit. **Example: HP Durable Frontlit Scrim Banner**, Ultraflex Normandy Pro, Verseidag banners…
HP Photorealistic	Paper based (cellulose) media with coating (gloss and matte finishing). It has a weight higher than the other billboard and offset medias (200gsm or higher). The main difference is its rigidity compared to the other billboard medias. **Example: HP Photo-realistic Poster Paper**
Paper - Solvent	Paper based (cellulose) medias with coating to allow their use in solvent printers. Also they usually have a limited water resistant performance. **Example: HP Blue Back Billboard Paper,** Intellicoat GPIOF140, blue back medias…

Substrate Family (or Printer Media Profile)	Description
Paper - Aqueous	Paper based (cellulose) media with or without coating. The main difference with the billboards is that offset papers are not compatible with solvent printers. Weight usually around the 100gsm
Mesh	Usually a polyester mesh covered with PVC coating with holes. Some of these media types can have a liner and be self adhesive. **Example: HP Mesh Banner with liner**, Ultraflex Stripmesh…
Fabric	Fabric medias are usually composed of polyester fibers. Some of the fabric media types come with a liner to avoid the ink trespassing the media. Fabric materials which are very stiff (such as polyester canvases) are preferably loaded as "banner". **Example: HP Wrinkle-free Flag with liner**…
Film	Usually a polyester film (although there are other materials like PVC, PC…) for backlit applications. They are typically translucent although there are transparent versions. **Example:** Intelicoat SBL-7 Polyester Backlit Film, …

2. Load the media. If media is smaller than machine width it's better to locate the media to the leftmost position in the spindle so it is centered in the print zone.





3. Disconnect OMAS in the RIP if substrate is transparent or dark, or if the printer recommends you to do so during the substrate load operation.
4. Launch Printheads Alignment.
5. In your RIP software, open the HP diagnostic chart, which you can obtain from the Embedded Web Server at:

http://ip-addr/hp/device/webAccess/images/new.tif

where *ip-addr* is the IP address of your printer. Alternatively, you can find the chart on the Web under:

http://www.hp.com/go/l25500/manuals/

6. Select the number of passes recommended in the "print mode recommendation matrix" for the family (or Printer Media Profile). These are generic proposals that works with most of the substrates available.

Recommended Print Modes

Faster printir ↑ / Better Image Quality ↓

Print mode	Unidirectional/ Bidirectional		Self-Adhesive Vinyl	Banner	HP Photorealistic	Paper-Solvent	Paper-aqueous	Mesh	Fabric	Film
Ink Limit Setting in RIP		Speed in sqft/h	Normal Ink Limit							High Ink Limit
4 pass	Bidir	250								
6 pass	Bidir	170					->Start here			
8 pass	Bidir	128		->Start here	->Start here	->Start here		->Start here		
10 pass	Bidir	100	->Start here							
12 pass	Bidir	85							->Start here	->Start here
16 pass	Bidir	79								
10 pass	Unidir	64								
12 pass	Unidir	55								
16 pass	Unidir	42								
18 pass	Unidir	35								

Legend	
->Start here	Recommended setting to start with.
	Other recommended settings.
	Setting where the unit might operate with sellable Image Quality.
	Non-recommended setting. Image Quality could be low or not stable across temperature and humitidy conditions.

NOTE: More specific settings for several substrates from different vendors is available in:

http://www.hp.com/go/L25500/solutions

If your are using HP Designjet 8000 with the following printmode...	We recommend you to start with:
4 pass bidirectional, 360x720	6 pass bidir
6 pass bidirectional, 720x540	8 pass bidir
8 pass bidirectional, 720x720	10 pass bidir
16 pass bidirectional, 720x720	16 pass bidir

If your are using HP Designjet 9000/10000 with the following printmode...	We recommend you to start with:
4 pass bidirectional, 720x720	6 pass bidir
8 pass bidirectional, 720x720	10 pass bidir
16 pass bidirectional, 720x720	16 pass bidir

7. Print the file.

Print mode parameters

Setting	Explanation	If too low	If too high
Number of passes	The number of passes specifies how many times the printheads will print over the same area of substrate.	The amount of ink fired per time unit is larger and ink has less time to dry on the substrate. This may create coalescence and banding. Because larger substrate advances are required and ink has to be placed faster on the substrate, the boundaries between passes are more visible. However, printing speed is relatively high. If number of passes < 12 the "High Ink Limit" setting is not available.	Colors are vivid, print quality is high, needs lower curing temperature and printhead health is well maintained. However, printing speed is relatively low.
Print direction: bidirectional (if checked) or unidirectional (if unchecked)	Specifies if printheads can print both when moving left to right and when moving right to left.	When set to bidi the amount of ink fired per time unit is larger, and therefore print quality defects such as coalescence and banding may occur, especially at the sides of the plot. However, printing speed is relatively high. This is the most suitable setting for tiling applications	When set to unidirectional, defects such as coalescence or bands (both horizontal and vertical) tend to reduce. However, printing speed is relatively low. In general, it advisable to increase the number of passes rather than selecting unidirectional.
High Ink Limit: Normal (if unchecked), High (if checked)	Maximum quantity of ink that will be laid on paper (high ink limit option only available when number of passes is 12 or larger). The ink quantity is further reduced by the RIP color profile.	TIP: Use normal ink limit for substrates such as PVC Scrim Banner Frontlit, Green Banner, Vinyl-Calendared, Vinyl-Cast, Blue back and Scrim banner.	TIP: Use High ink limit options for backlit substrates.

4. Optimize media settings

HP and third party media profiles have their own substrate settings which will have been optimized to maximize the printer performance in terms of image quality and printing speed.

You might need, however, use other substrate settings for your specific substrate so here are the recommended defaults for a "generic" substrate to use as start for your "add new substrate process". Your RIP might have an option to set your RIP settings to these defaults so that you don't have to change each one manually, consult your RIP documentation. Moreover, you can consult several substrates settings in:

http://www.hp.com/go/L25500/solutions

Recommended default substrate settings

Substrate family	Main Printer settings							
	Drying Temperature	Curing Temp	Heating AirFlow	Automatic tracking (OMAS)	Cutter enable	Substrate advance compensation	Input Tension	Vacuum level
Banner	50	110	45	Yes	Disabled	0	15	5
Self-Adhesive	55	110	45	Yes	Enabled	0	15	25
Fabric	55	100	45	Yes	Disabled	0	15	20
Paper-Solvent	50	90	30	Yes	Enabled	0	15	15
HP Photorealistic	50	90	30	Yes	Enabled	0	15	40
Mesh	50	95	30	Yes	Enabled	0	15	15
Film	55	95	60	Yes	Enabled	0	15	20
Paper-Aqueous	45	70	30	Yes	Enabled	0	15	20

Main printer settings

Setting	Explanation	If too low	If too high
Drying temperature	The heat applied in the printing zone removes water and fixes the image to the substrate.	Print quality defects such as bands, bleeding and coalescence may occur.	Thermal marks may be seen on the substrate; they may appear as vertical bands in some colors. The substrate may wrinkle on the platen, causing vertical banding, ink smears or substrate jams.
Curing temperature	Curing is needed to coalesce the latex, creating a polymeric film which acts as a protective layer, while at the same time removing the remaining co-solvents from the print. Curing is vital to ensure the durability of the printed	The print may emerge not fully polymerized, so that the ink smears when rubbed with the finger. In some other cases the print may appear wet, or get a wet appearance some time after printing. You might need a	The substrate may wrinkle under the curing module, causing media defects such as bubbles or liner detachment. The substrate wrinkles may also create vertical bands or ink smears at the beginning of the following plot.

	images.	higher number of passes to get the print fully dried,	
Heating Airflow	Airflow helps removing the evaporated water from the print zone and thus allows more efficient drying conditions.	Print quality defects such as banding, bleeding and coalescence may occur.	Printer may not reach expected temperature in the print zone thus creating print quality defects such as banding, bleeding and coalescence. Poor text and line quality may appear.
Automatic tracking (OMAS)	OMAS is an automatic sensing device located under the print platen that tracks the substrate movement to provide optimum advance accuracy.	Disable OMAS when: - the substrate is porous and will allow ink to trespass to the platen. Clean OMAS after using this media. - you are instructed by the front panel after substrate load or after a job, as OMAS is either dirty or it can not track this particular media.	
Cutter enabled	The internal substrate cutter of the printer cuts transversally after every plot.	disable the cutter in case: - the Take-Up Reel is used - the substrate will be cut with an external device - the leading edge of the substrate is too curly and produces media crashes	
Substrate Advance Compensation	Your printer was calibrated at the factory to ensure that it advances the media accurately when using supported media types in normal environmental conditions. However, you may find it useful to recalibrate in certain	Dark lines appear when number of passes is 6 or below. Graininess appears when number of passes is 8 and above.	White lines appear when number of passes is 6 or below. Graininess appears when number of passes is 8 and above.

	circumstances: Unsupported media: different media manufacturers provide media with a wide range of properties such as thickness or stiffness, which may benefit from calibration. Abnormal but stable environmental conditions: if you are printing in unusual conditions of temperature or humidity and those conditions are expected to remain stable, recalibration may be worthwhile.		
Input Tension	Tension is applied to the media through its input roll. It needs to be constant on the full width the substrate, thus substrate load is a critical operation.	The substrate skews and may become increasingly wrinkled in the printing zone. Also, substrate advance may be irregular, resulting in horizontal bands	The substrate may be permanently deformed or damaged. Media advance problems may appear in extreme cases.
Vacuum Level	The vacuum applied to the substrate at the printing zone helps to hold the substrate down on the print platen, keeping the distance to the printheads constant.	The substrate can lift up off the platen and touch the printheads. This can smear the printed image, cause a substrate jam or even damage the printheads.	For sticky substrates, friction could be too high and substrate advance irregular, resulting in horizontal bands or irregular grainy patches.

Advanced printer settings

There are also some advanced parameters for further optimization. **The next ones shouldn't be changed unless you have reached to this point following "troubleshoot substrate issues**". Remember that you can return any time to the defaults using a "reset to defaults" feature in the RIP in case you chose wrong settings:

Substrate family	Advanced options				
	Warmup drying temperature offset	Warmup curing temperature offset	Cool-down drying temperature offset	Cool-down curing temperature offset	Minimum drying power
Banner	5	0	0	0	1.2
Self-Adhesive	5	0	0	0	1.2
Fabric	5	0	0	0	1
Paper-Solvent	5	0	0	0	1
HP Photorealistic	5	0	0	0	0
Mesh	5	0	0	0	1
Film	5	0	0	0	1
Paper-Aqueous	5	0	0	0	0

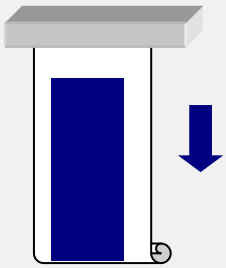
Setting	Explanation	If too low	If too high
Warm-Up Drying Temperature Offset	Temperature the media at the print zone must reach before start printing.	Bleeding or coalescence may appear in the first 200-300 mm of the plot	A longer time to start printing is required. Vertical bands or ink smears may occur.
Warm-Up Curing Temperature Offset	Temperature that the media at the curing zone must reach before start printing	Beginning of plot not fully dry or with oily appearance	Media degradation (bubbles, adhesive detachment) at the beginning of plot
Cool-Down Drying Temperature Offset	Safe temperature at which the media can be under the dryer without being damaged. At the end of a job, the media is not stopped until this temperature is reached.	A long time is needed to finish the print	The media at the beginning of the next plot may be damaged as the media has stopped moving under a too high temperature. This case is uncommon.
Cool-Down Curing Temperature Offset	Safe temperature at which the media can be under the curing module without being damaged. At the end of a job, the media is not stopped until this temperature is reached.	A long time is needed to finish the print	The end of the plot may be damaged if the cutter is disabled.
Minimum Drying Power	Minimum power applied in the dryer while printing so the media does not cool too much in light inked areas	A heavy inked area after a light one will have bleed or coalescence defects.	Media is damaged in blank or light inked areas of the plot, especially in high number of passes.

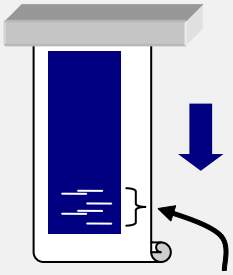
5. IMAGE QUALITY TROUBLESHOOTING

Before continuing, please check the following items:

- Ensure that all previous steps in the "**Add New Substrate**" procedure have been followed.
- Check that the media physically loaded is the same that has been specified in the Front Panel and in the RIP.

Substrate Jams or Ink Smears

<table>
<tr><th></th><th>Cause</th><th>Solutions</th></tr>
<tr><td rowspan="2">Media Jam
you have a substrate jam or an ink smear along the whole image
  </td><td>Media may have been loaded with too much skew.</td><td>Make sure that you have not skipped the "Media was loaded with too much skew" warning on the media load process.</td></tr>
<tr><td>Substrate shape may be affected by Drying Temperature.</td><td>Simultaneously do the following actions until the problem disappears:
o Set the Drying Temperature to 50°C and
o Increase the vacuum level in steps of 5 mmH2O. Do not go over the following limits:
<table><tr><th>Substrate family (or Printer Media Profile)</th><th>Maximum vacuum level (mmH2O)</th></tr><tr><td>Banner</td><td>20</td></tr><tr><td>Vinyl</td><td>35</td></tr><tr><td>Other families</td><td>50</td></tr></table>o Increase Back tension in 5 steps up to 30 maximum</td></tr>
</table>

 Problem appears only in the first 200mm of the image.	The initial portion of the image has been affected by the Curing process of the previous plot. Try the following solutions in order:	Disable cutter. This allows better substrate control at begin of plot. If problem persists set the Extra BottomMargin: Front Panel menu >Substrate menu>Substrate Handling Options to 100mm. If this solution does not work, try again with the Extra Bottom Margin set to 200mm. This extra margin will apply only to jobs that start printing when printer is idle and when the cutter is disabled.
	The initial portion of the image has been affected by a Warm-up Drying temperature too high.	Decrease the Warm-Up Drying temperature in 5°C steps until 0.
	If media has excessive curling, bubbles , burnt appearance not allowing you to laminate it or hung it perfectly flat	Decrease the Curing temperature in 5°C steps until curling disappears
	If problem is not solved with previous solution or there are durability problems.	Increase the number of passes.

Checking the ink quantity on the substrate

Check if the ink quantities in your profile are adequate.

Too much ink quantity

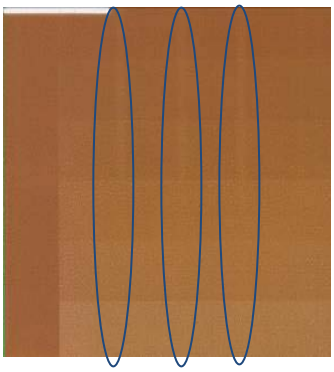
The patch shows one or more of the following problems:

Solution:

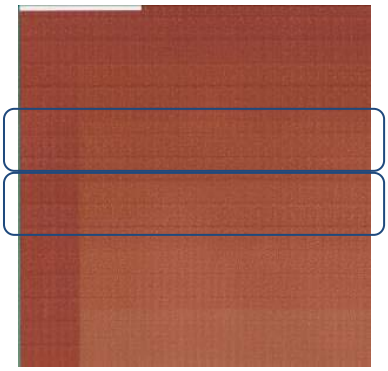
- Lower the ink quantity using Lower the ink quantities using your RIP, consult your RIP documentation for doing so.
- User a substrate profile which uses less ink. For example: Self adhesive profiles use more ink than Paper-aqueous ones

The last two or three scales of the plot look the same:

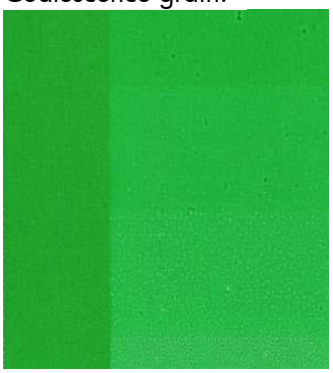
Vertical bands:



Horizontal bands:



Coalescence grain:



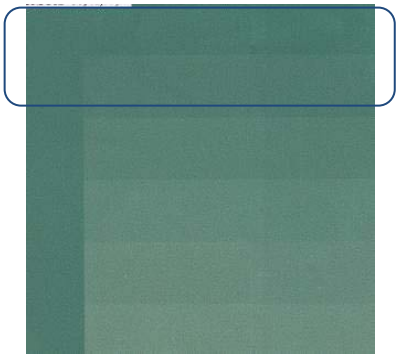
Too little ink quantity

The whole plot looks washed out.

Solutions:

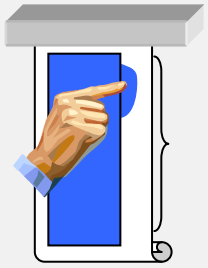
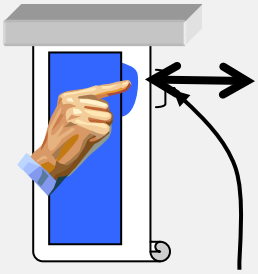
- Lower ink quantity, consult your RIP documentation for doing so
- Try another profile which uses more ink. For example Self adhesive profiles use more ink than Paper-aqueous

NOTE: Backlit substrates usually require to be used with the "High Ink Limit" option enabled in the RIP.

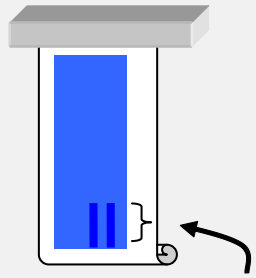
Correct ink quantity The patch has no defects **and** Increasing amounts of ink result on increasing color density.	The last scales of the plot show a smooth increase: 

Ink smudge issues

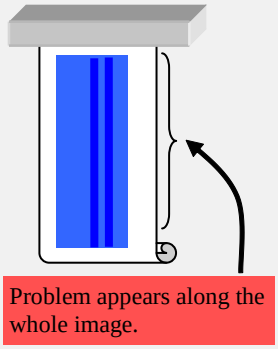
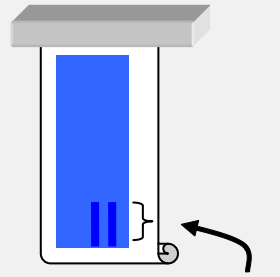
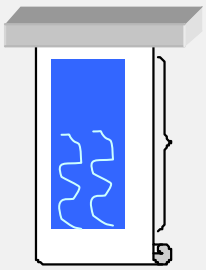
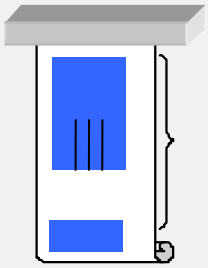
Ink Smudge when touched or image has an "oily" finishing

	Cause	Solutions
 Problems appear along the whole image.	The Curing procedure was done at a temperature that was too low. If the "oily finishing" appears some minutes or hours after having printed the plot:	- Increase the curing temperature in 5°C steps, as many times as needed. - If problem is not solved with previous solution (because media gets damaged or because you reach the limit in the RIP control), then increase the number of passes.
	If the "oily finishing" appears some minutes or hours after having printed the plot:	- Increase the curing temperature in 5°C steps, as many times as needed. - Do not store plots with printed faces touching each other. - Use the Take-Up Reel.
 Problems appear only in the first 200mm of the image.	The Curing procedure was done at a temperature that was too low.	- Increase the Warm-Up Curing temperature in 5°C steps, as many times as needed. - If problem is not solved with previous solution (because media gets damaged or because you reach the limit in the RIP control), then increase the number of passes.

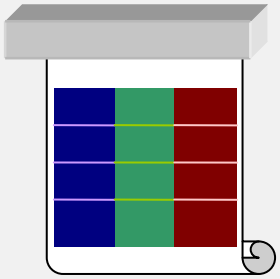
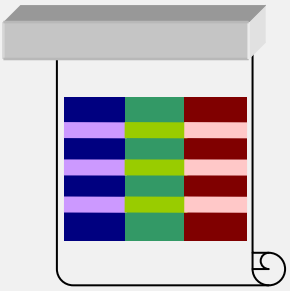
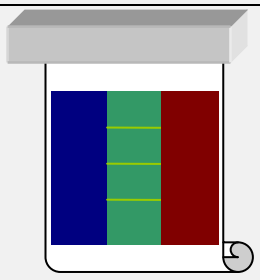
Graininess or coalescence on dark or saturated colors

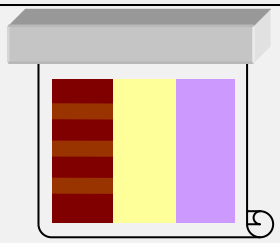
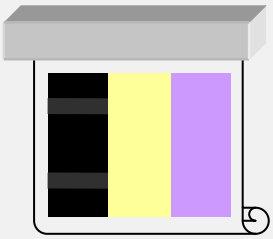
	Cause	Solutions
Grain or ink coalescence appears in different areas of the plot 	If graininess problem is more visible in dark or saturated colors it may be an ink coalescence problem	- Use a higher number of passes *or* - Lower the ink quantity through the RIP controls.
Grain appears in different areas of the plot	The Printheads could be misaligned. This is probable if you performed Printheads Alignment on another substrate or there has been a substrate jam.	Perform PH alignment.
 Problem appears only in the first 200mm of the image.	The substrate may not be advancing properly. This applies only to printmodes of 8 or more passes.	- for printmodes of 8 or more passes: Adjust the Substrate Advance Compensation parameter by printing the Substrate Advance plot (Front Panel → Ink → Ink Quality Maintenance). In this plot locate the position of the lightest band and introduce the value in the RIP. - For printmodes of 6 passes or less it is unlikely that a Substrate Advance problem creates graininess. See *horizontal bands* section for more details
	Printmodes of 8 passes and less tend to have more graininess.	If previous solutions have not reduced enough the graininess level, use a printmode of 10 passes or more.

Vertical Bands

	Cause	Solutions
Vertical straight bands of different color (and sometimes or different graininess) appear on the image  Problem appears along the whole image.	If problem appears along the whole image, drying temperature and/or airflow may be too high for that substrate.	Reduce airflow in 15% steps, down to 30% minimum. If the problem disappears but then there is bleed, coalescence, or not enough durability this media will require to be used with a higher number of passes or with lower ink quantity
 Problem appears only in the first 200mm of the image.	If problem appears only in the first 200mm of the image, the initial portion of the image has been affected by the Curing process of the previous plot. That may change substrate shape which results on Vertical Bands.	- Disable cutter - Set the Extra Bottom Margin (Front Panel->Substrate menu->Substrate Handling Options) to 100mm. If this solution does not work, try again with the Extra Bottom Margin set to 200mm. This extra margin will apply only to jobs that start printing when printer is idle, and when the cutter is disabled. - Decrease Warm-Up Drying temperature in steps of 5°C
	If problem appears only in the first 100mm of the image and lines are S-shaped	- Decrease Cool down Curing temperature in 5 degrees step since it affects the next plot behavior, or - Set in you RIP the Top margin to 50mm.
	If problem appears only after a low to high density area fill transition, the initial portion of the area fill has been affected by the previous white area fill. That may change substrate temperature profile which results on Vertical Bands.	Increase Minimum drying power in 0.2 steps in RIP "advanced settings"

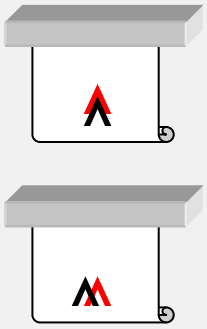
Horizontal bands

	Cause	Solutions
There are horizontal bands or lines across the plot width 	If bands affect most of the colors, the printheads could be misaligned. This is probable if you performed Printheads Alignment on another substrate or there has been a substrate jam.	Perform Printheads Alignment
	Another cause for this problem could be a Substrate Advance problem. This applies only to printmodes of 6 passes and less.	- **For printmodes of 6 passes or less:** When unit is printing, try to reduce Horizontal Bands by changing the Substrate Advance Compensation parameter through the "on-the-fly" button the Front Panel (it is the same button used to Move Substrate when printer is idle). ▪ If plot shows dark lines then **increase** the Substrate Advance Compensation factor. ▪ If plot shows light lines then **decrease** the Substrate Advance Compensation factor. ▪ When done, store the value in the RIP **- For printmodes of 8 passes or more:** it is unlikely that a Substrate Advance problem creates bands. See ***graininess*** section for more details
	Could be a fiber attached to any of the printheads.	Remove printheads and remove any fiber attached to them.
	If bands affect *only* some colors, the cause could be a defective printhead.	- Step1: Print the Nozzle Health Check plot. Check if any of the printheads have a significant number of missing nozzles. If so, perform a "Clean PHs procedure" on the affected printhead. After doing so reprint your used plot to see if

		the banding problem persists. - Step 2: If the problem persists, repeat step 1. - Step 3: If the problem persists, try performing the Manual Printheads Alignment procedure. When done, print your user plot. - Step 4: If the problem still persists, then print the Nozzle Health Check plot. Identify the printhead with more missing nozzles and replace it
	If bands affect mostly **dark or saturated colors**, or affects only **area fills near the edges** of the substrate, the cause could be insufficient drying of the ink	Use a higher number of passes
	If bands affect mostly **black colors**, the cause could be a sub-optimal generation of the color profile for K.	Generate the color profile using "pure K" or K with little under printing of other colors. See your RIP User Manual for more details.

Color Registration

Color planes are shifted in any direction

	Cause	Solutions
	The printheads could be misaligned. This is probable if you performed *Printheads Alignment* on another substrate or there has been a substrate jam.	Perform troubleshooting process of *Printheads Alignment* and print *Printheads Alignment diagnostic plot*

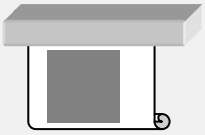
Sharpness

Text, lines or solid areas are rough or blurred

	Cause	Solutions
	The Printheads could be misaligned. This a probable if you have not done a printheads alignment for a long time or there has been a substrate jam.	Perform troubleshooting process of PH alignment and print PH alignment diagnostic plot

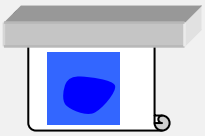
Black areas look hazy or image gloss is not completely uniform

Black area fills don't look totally black or look hazy

	Cause	Solutions
	Better drying may benefit the Optical Density and appearance of black areas.	- Use a higher number of passes - Lamination would level the image glossiness: laminate the printed image.

Stains or uneven finishing of image

Area fills show subtle stains or an uneven appearance

	Cause	Solutions
	Subtle color differences may appear in some medias if storage after printing is done with objects partially covering the printout.	Affected substrates should be stored right after printing either totally covered or totally uncovered. For covered storage right after printing, it may be advisable to avoid the prolonged contact of two printed faces. Those problems tend to disappear once the media is left uncovered for some time.
	Media coating has a defect.	Use another roll of the same media.

6. How to print at faster speeds

The "Add New Substrate" procedure describes a way to setup printing which results on sellable indoor Image Quality for the majority available substrates. However, most substrates support faster printing while providing enough Image Quality for many applications.

This section describes tips to speed-up printing:

- **Decrease the number of passes,** If you do so bear in mind that:
  - 8 pass printing may have more graininess than 10 passes and beyond.
  - 4 and 6 pass printing is more sensitive to Substrate Advance problems.
  - 4 and 6 pass printing may provide better results if the ink quantity is reduced in the RIP.
  - Lower passes print modes (4-6) might need lower ink usage than higher number of passes for ink to properly get dried and durability. A generic guideline to start from is:

	Ink reduction percentage vs. ink quantity used in 8 passes
6 passes	30%
4 passes	50%

  - High Ink Limit printing is available only for 12 passes or more.
  - Decreasing passes may make it more difficult to find appropriate Curing temperature setting, or may make them more sensitive to ambient temperature and humidity conditions.
- **Take advantage of the "concatenated plots" feature**
  If a plot is sent while the previous one is being printed they are concatenated so that finishing time is saved.
- **Disable the cutter**
  In most substrates this speeds up the Finishing Print stage.
- **Increase the Cool-Down Curing temperatures**
  This stops image finishing procedure when the printer is still warm. Some substrates may experience a slight deformation near the end of the printed image.

7. SUMMARY FOR MOST COMMON SUBSTRATE PROBLEMS

Here is the table of likely problems and the RIP parameters that should be changed in order they should be tried to solve the issue. There is also which could be the potential side effect which doesn't necessary show up.

Issue	Parameter	Increase/ Decrease	Potential side effect
Durability problems, Ink smudges or with an oily finishing	Curing temperature	Increase	Substrate jam, ink smears, damaged media
	Number of passes	Increase	Printing speed loss
Substrate jam, ink smears, damaged media	Curing temperature	Decrease	Durability loss (smudge) or "oily" plot finishing
	Vacuum change and Disable cutter	Increase	Substrate skew
	Top and/or bottom margins	Increase	Substrate waste
	Drying temperature	Decrease	Image quality: more coalescence and/or banding Durability loss (smudge) or "oily" plot finishing
Horizontal and/or thin vertical bands (2mm) in highly saturated area fills Graininess or coalescence on dark or saturated colors	Drying temperature	Increase	Substrate jam, ink smears, damaged media
	Ink limits	Decrease (depends on RIP)	Color gamut loss
	Number of passes	Increase	Printing speed loss
	Airflow	Increase 15%	
Graininess, Color mis-registration or lack of sharpness	Run print printhead alignment		
	Perform troubleshooting process of substrate advance calibration.		
Black areas look hazy or image gloss is not completely uniform	Modify color separations and black color generation resources		
	Airflow	Increase 15%	

	Drying temperature	Increase	Substrate jam, ink smears, damaged media
	Number of passes	Increase	Printing speed loss
	Curing temperature	Decrease	Durability loss (smudge) or "oily" plot finishing